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out. If the best solution is not attainable, then the second best may be adopted, but it may be the earnest hope of all that, after the fullest consideration of the matter, all parties interested may be led to cooperate in the attainment of a plan by which the interests of national agriculture may be safeguarded without the sacrifice of any legitimate interest.

The problem before the government, the national agriculture, and the exporting company, is this: How can the guano industry be saved to the future? Certainly no legitimate interest can be furthered by a continuance of the present unsatisfactory system, with its sacrifice of the birds.

I think the solution of the problem will be furthered if we put the question in this way: What system of regulation will result in the greatest annual deposit of guano twenty years hence?

NOTE

Without attempting at this time precise figures, the following considerations are suggestive and not misleading.

If we take a cubic meter of guano as a ton, then, with an average thickness of 10 cm. (4 inches), an area 10 meters by 10 meters, or 100 square meters, would yield ten tons of guano, and on 60,000 square meters there would be 6,000 tons. A point of significance, economically speaking, is the commercial value of permitting the birds to make the deposit even one centimeter thicker during the year. The flock of cormorants, *Phalacrocorax bougainvillaei*, which covered very closely an area of 60,000 square meters (15 acres) and was the largest single aggregation of birds on the coast of Peru, was seen on the south Chincha island last year. It is easy to find that the nests average about three to the square meter, giving a total of about 180,000 nests. Allowing four birds to the nest, that is, a pair of adults and a pair of young, we have 720,000 birds. Two months later I estimated the flock as fifty per cent. larger, the island being at that time, in fact, practically entirely and densely covered with birds. It is not extravagant, then, to say that there were at least one million birds. Of course, very much smaller flocks are commonly esti-

mated at "millions." Nor, again, does it seem out of reason to say that, had this island been opened by the government for extraction of guano, each month that the work endured would have caused the loss from this island of nearly 1,000 tons of guano, a part of which quantity, it is true, would have been deposited on other islands, but a large part of which would doubtless have been irrevocably lost. However, the main point to bear in mind, both from the point of view of the economist and from that of the naturalist, is this—that the continual disturbance of the birds means inevitably their gradual extermination.

ROBERT E. COKER

LIMA, PERU,
April 8, 1908

SOCIETIES AND ACADEMIES

THE PHILOSOPHICAL SOCIETY OF WASHINGTON

THE 651st meeting was held on May 23, 1908, President Bauer presiding. By invitation, Professor Bailey Willis, of the U. S. Geological Survey, presented and explained the proposal of the Washington Academy of Sciences to establish a weekly *Journal of Science*. The character and scope of the proposed publication were described at some length. The academy is to bear the entire cost of maintaining the *Journal* for the first three years and during this time the members of the affiliated societies are to receive the publication free of cost. In return for this service during the three years' experimental stage of the *Journal* the academy asks that the affiliated societies shall give the *Journal* their programs to print and for which they shall pay. Short abstracts of the papers read before the societies are to be submitted to the society for publication. At the close of the three years' experimental period it is proposed that the *Journal* shall thereafter be paid for by the affiliated societies at the rate of two dollars per member per annum.

Mr. R. L. Faris read a paper on "Tides in the Solid Earth observed by Dr. Hecker," being a review of the results of the horizontal pendulum observations recently published by Dr. Hecker at Potsdam. This paper will be published in full in the May, 1908, number of the *Monthly Weather Review*.

R. L. FARIS,
Secretary